GNNs for LUXE particle tracking

Status update

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21 March 2022

Graph production using new data

We are able to produce graphs using new data. My code code should be performing exactly the same preselection (compared to Hamburg team) at the doublet level.

Some statistics on the preselection. Dataset: 23-2-2022-1.25T-4.0_NS

10 graphs are produced from 10 events using 500 most energetic particles.

Total: True edges: 15000 Fake edges: 100361

Efficiency: 1.0000, Purity: 0.1300

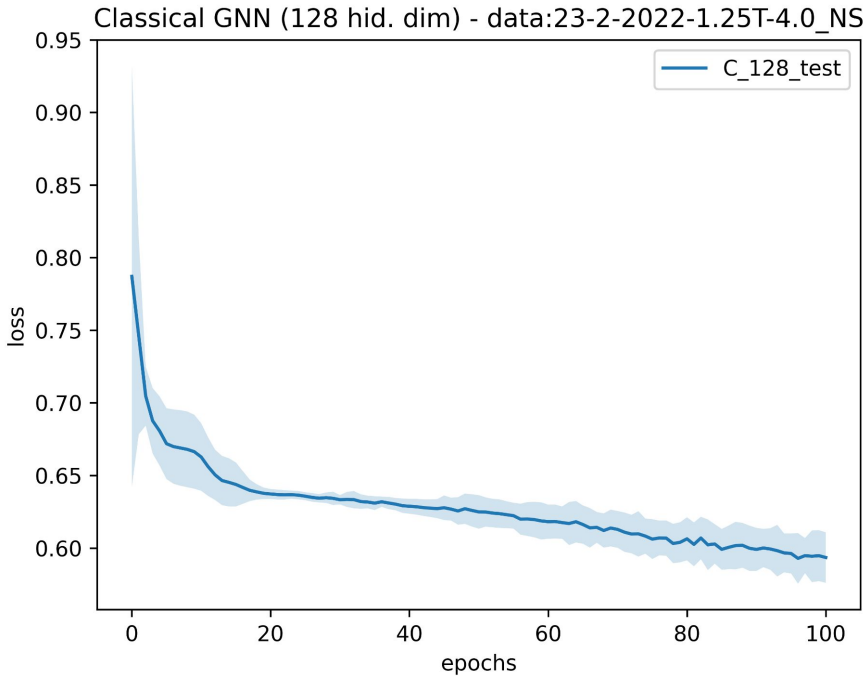
Initial training results

I trained a classical GNN model, which should be large enough to give us good results.

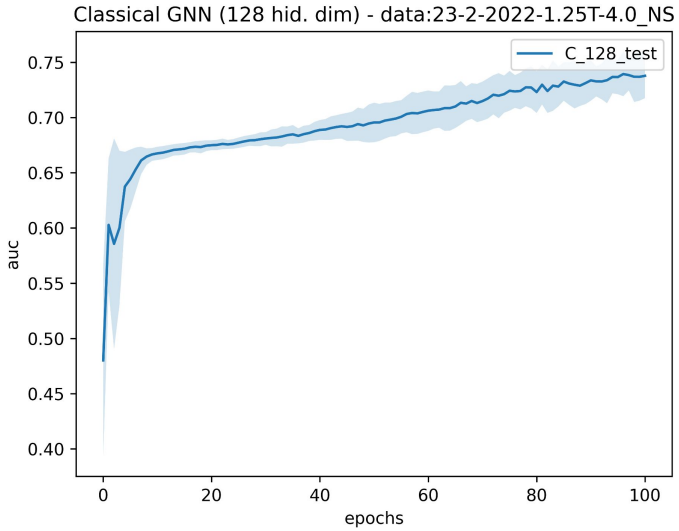
The first thing to note here is that the loss is still decreasing after 100 epochs. This indicates a lack of a data. I am expecting a faster decrease of loss if we had more data.

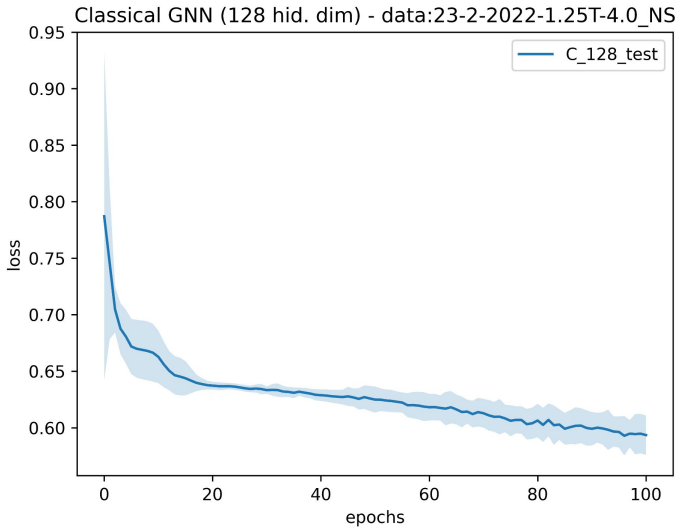
I could only use 9 events in the training set and 1 event in the test set.

Question: Can we have more?



Initial training results





The continuous improvement is also evident if we look at the AUC. It reached 0.75 after 100 epochs, which is a not an ideal result.